

310 CMR 32.00: LAND APPLICATION OF SLUDGE AND SEPTAGE

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32.01: Authority

310 CMR 32.00 is promulgated pursuant to the authority granted by M.G.L. c. 21, §§ 27(9), 27(12) and 43; M.G.L. c. 21A, § 2(28); and M.G.L. c. 111, § 160. Pursuant to M.G.L. c. 30A, §§ 1(5), 2, and 3, 310 CMR 32.00 is promulgated to set forth standards and requirements of general application and future effect which shall be used to implement, interpret, and enforce M.G.L. c. 21, §§ 33D and 34; M.G.L. c. 83, §§ 6 and 7; and M.G.L. c. 111, §§ 5G, 17, 31D, and 150A.

32.02: Purpose

310 CMR 32.00 is intended to allow the land application of sludge and septage for beneficial purposes in a manner that will protect public health and the environment from possible contamination which could occur from pathogens, metals, or toxic chemical compounds.

32.03: Severability

It is hereby declared that the provisions of 310 CMR 32.00 are severable, and if any provision hereof or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions which can be given effect without the invalid provisions or application.

32.04: Effective Date

310 CMR 32.00 shall take effect on September 11, 1992.

32.05: Definitions

As used throughout 310 CMR 32.00, the following terms shall have the following meanings, unless the context clearly indicates otherwise.

Aquifer means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water from wells or springs.

Beneficial purpose means to provide nutrients to growing vegetation or to improve the quality of soil for the purpose of growing vegetation.

Cation exchange capacity means the sum of the exchangeable cations which a soil can adsorb, as determined by sampling the soil to the depth of cultivation or of sludge or septage land application, whichever depth is greater.

Chroma means the relative purity or strength of the spectral color, which increases with decreasing grayness.

Class A Water means inland surface water which is classified from time to time as Class A pursuant to 314 CMR 4.00.

Coarse Sand means sand of which less than 15% passes sieve no. 270 (0.05 mm) and more than 25% is retained on sieve no. 35 (0.5 mm), and which contains less than 50% of any other one grade of sand. *See Soil Survey Manual, U.S. Department of Agriculture Handbook No. 18*, dated 1951, written by the "Soil Survey Staff", published by the U.S. Government Printing Office, Washington, D.C.

Department means the Massachusetts Department of Environmental Protection.

Digestion means the biological process by which microorganisms break down and use organic matter. There are three types of digestive organisms: aerobic microorganisms, which function only in the presence of free oxygen; anaerobic microorganisms, which function only in the absence of free oxygen; and facultative microorganisms, which can function with or without free oxygen.

Dry weight means the weight of a substance not including its moisture content.

EPA means the United States Environmental Protection Agency.

Facility means a site or works for the treatment or storage of water, wastewater, septage or sludge.

Food-chain crop means tobacco, any crop grown for human consumption, or any crop grown for consumption by animals which are to be consumed by humans.

Groundwater means water below the land surface in a zone of saturation.

Groundwater table means the top of the saturated zone in the soil, as indicated by the level at which water stands in an open borehole after adequate time is allowed for the establishment of a stable water level.

Industrial discharge means discharge of wastewater consisting in whole or in part of industrial process waste.

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Land application means fertilizing or amending soil by:

- (a) applying to the surface of soil by spreading, spraying, or other similar means, and/or
- (b) mixing or working into the soil or beneath the surface of the soil within the root zone of the crop by harrowing, plowing, rototilling, injecting, or other similar means.

Land Apply means to engage in land application.

Matrix means the interior portion of soil aggregate.

Maximum high groundwater table means the height of the ground water table when it is at its maximum annual level or elevation. This level is usually reached sometime during the months of December through April.

Mottle means contrasting color patches that vary in number and size and are usually associated with excess moisture in soil during parts of the year.

Munsell color notation means the standardized system of color charts produced by Munsell Color Co., Inc., Baltimore, Maryland.

Operator means the person responsible for the overall operation of:

- (a) in the case of sludge, any drinking water treatment facility or any wastewater treatment facility, including, without limitation, any sewage treatment plant or industrial pretreatment plant that generates sludge, and
- (b) in the case of septage, any facility for the receipt, storage, or disposal of the contents of privies, cesspools, or septic tanks.

Owner means any person who has effective control or legal ownership of:

- (a) in the case of sludge, any drinking water treatment facility or any wastewater treatment facility, including, without limitation, any sewage treatment plant or industrial pretreatment plant that generates sludge, and
- (b) in the case of septage, any facility for the receipt, storage, or disposal of the contents of privies, cesspools, or septic tanks.

The term owner does not include persons who hold bare legal title for the purpose of providing security for a financial agreement.

Pasture land means land which is or is intended to be grazed by animals intended for human consumption, or whose milk is intended for human consumption, or land on which one or more forage crops are or are intended to be grown.

PCBs means polychlorinated biphenyls.

Person means any agency or political subdivision of the Commonwealth, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association, or other entity, and any officer, employee or agent of said person, and any group of said persons.

pH means the measure of acidity or alkalinity as the logarithm of the reciprocal of the molar hydrogen ion concentration of a solution.

Potential groundwater public water supply means:

- (a) a groundwater source which has capability of sustaining a yield of 100 gallons or more per minute of drinking water, as designated by the United States Geological Survey Hydrological Atlas, and which has less than 10,000 ppm total dissolved solids, or
- (b) groundwater within land procured by a body politic for the purpose of supplying drinking water.

The term potential groundwater public water supply does not include an aquifer which is not an underground source of drinking water pursuant to 310 CMR 27.00: *Underground Water Source Protection*.

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Private drinking water supply well means a well used as a source of drinking water, supplying a non-public water system with any volume of groundwater from any source.

Public water supply means a source of drinking water supplying a public water system.

Public water system means a public water system as defined in 310 CMR 22.02, as may be amended from time to time.

Putrescible means decaying and foul-smelling.

Septage means the liquid, solid, and semi-solid contents of privies, chemical toilets, cesspools, holding tanks, or other sewage waste receptacles. For purposes of 310 CMR 32.00, the term septage does not include any material which is hazardous waste pursuant to 310 CMR 30.000. (The land application of hazardous waste is not authorized by 310 CMR 32.00 and is subject to 310 CMR 30.000.)

Sludge means the solid, semi-solid, and liquid residue that results from a process of wastewater treatment or drinking water treatment. This residue does not include grit, screening, or grease and oil which are removed at the headworks of a facility. For the purpose of 310 CMR 32.00, the term "sewage" as used in M.G.L. c. 111, § 150A and 310 CMR 19.00 includes wastewater treatment plant sludge which is not hazardous waste pursuant to 310 CMR 30.000.

Storage means containment or stockpiling prior to or during selling or distributing or reuse, or offering for sale, distribution, or use.

Surface soil means the soil ordinarily moved in tillage or its equivalent in uncultivated soil, ranging in depth from four to ten inches below the surface, and frequently designated as the "plow layer" or the "Ap horizon".

Surface water means water that is visible on the ground surface, including, without limitation, streams, brooks, rivers, lakes, ponds, and wetlands.

USDA means the United States Department of Agriculture.

Use means land application or to land apply.

32.06: Computation of Time

Unless otherwise specifically provided by law, 310 CMR 32.00, or any determination issued pursuant to 310 CMR 32.00, any time period prescribed or referred to in 310 CMR 32.00 or in any determination issued pursuant to 310 CMR 32.00 shall begin with the first day following the act which initiates the running of the time period, and shall include every calendar day, including the last day of the time period so computed. If the last day is a Saturday, Sunday, legal holiday, or any other day in which the offices of the Department are closed, the deadline shall run until the end of the next business day. If the time period prescribed or referred to is less than seven days, only days when the offices of the Department are open shall be included in the computation.

32.07: Accurate and Timely Submittals

(1) No person shall make any false, inaccurate, or misleading statement in any application, record, report, plan, or statement which that person submits, or is required to submit, to the Department or to a board of health pursuant to 310 CMR 32.00 or any order issued by the Department.

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(2) Any application, record, report, plan, or statement which any person is required to submit to the Department or to a board of health shall be submitted within the time period prescribed in 310 CMR 32.00 or any order issued by the Department, unless otherwise specified by the Department.

(3) Failure to comply with any requirement of 310 CMR 32.07 shall be grounds for appropriate legal action including, without limitation, suspension or revocation of any approval granted by the Department pursuant to 310 CMR 32.00.

32.08: Accurate and Complete Record Keeping

(1) No person shall make any false, inaccurate, or misleading statement in any record, report, plan, file, log, or register which that person keeps, or is required to keep, pursuant to 310 CMR 32.00. Any record, report, plan, file, log, or register which any person is required to keep shall be filled out completely and otherwise kept in compliance with 310 CMR 32.00, or any order issued by the Department.

(2) Failure to comply with any requirement of 310 CMR 32.08 shall be grounds for appropriate legal action including, without limitation, suspension or revocation of any approval granted by the Department pursuant to 310 CMR 32.00.

32.09: General Restrictions on Land Application and Storage of Sludge and Septage

(1) Any person who uses, sells, or distributes or offers for use, sale or distribution sludge or septage for land application in Massachusetts shall do so only in compliance with 310 CMR 32.00.

(2) 310 CMR 32.00 shall authorize only the placement of sludge or septage on or in the ground for:

- (a) land application for beneficial purposes, or
- (b) storage pending use, sale, or distribution for land application for beneficial purposes.

(3) No person shall land apply sludge or septage in such a manner that it results in violation of 310 CMR 7.00: *Air Pollution Control* or 314 CMR (Water Pollution Control).

(4) The land application or the collection, transportation, storage, treatment and disposal of hazardous waste is not authorized by 310 CMR 32.00 and is subject to regulation pursuant to 310 CMR 30.000.

(5) Any project for land application of sludge or septage as provided in 310 CMR 32.09(2) in existence on November 15, 1983 shall be brought into compliance with 310 CMR 32.00, as soon as is feasible but not later than November 15, 1984. The Department may establish a compliance schedule on a case-by-case basis for any such project.

32.10: Classification of Sludge and Septage

The Department shall classify sludge and septage in accordance with the criteria in 310 CMR 32.12(2) as follows:

(1) Type I - Sludge approved by the Department pursuant to 310 CMR 32.00 which may be used, sold, or distributed or offered for use, sale, or distribution on any site without further approval of the Department, and which may be used for growing vegetation. Septage shall not be eligible for Type I classification.

(2) Type II - Sludge and septage approved by the Department pursuant to 310 CMR 32.00 which may be used, sold, or distributed or offered for use, sale, or distribution on a site only with prior approval of the Department, and which may be used for growing any vegetation.

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(3) Type III - Sludge and septage approved by the Department pursuant to 310 CMR 32.00 which may be used, sold, or distributed or offered for use, sale, or distribution for land application on a site only with prior approval of the Department, which may be used for growing any vegetation not including direct food chain crops, and whose land application to a site must be recorded in the registry of deeds in the chain of title for such site.

32.11: Department Approval of Sludge or Septage for Beneficial Purposes

(1) In order to be used, sold, or distributed or offered for use, sale, or distribution for beneficial purposes, sludge and septage shall have to meet the criteria of suitability set forth in 310 CMR 32.12, and shall be the subject of an Approval of Suitability then in effect pursuant to 310 CMR 32.00.

(2) No person shall use, sell, or distribute or offer for use, sale, or distribution in Massachusetts sludge or septage unless such sludge or septage is the subject of an Approval of Suitability then in effect pursuant to 310 CMR 32.00.

(3) Each Approval of Suitability issued by the Department shall be subject to 310 CMR 32.00 and such terms and conditions as the Department may reasonably impose. Each Approval of Suitability shall specify the type classification for the sludge or septage under consideration as determined by the Department pursuant to 310 CMR 32.12. Every person using, selling, or distributing or offering for use, sale, or distribution sludge or septage shall do so only in accordance with the classification and the terms and conditions specified in the Approval of Suitability issued for such sludge or septage.

(4) Each Approval of Suitability shall be valid for no more than two years from the date of issuance.

(5) The Department may prescribe an application form or forms which shall be used by any person applying for an Approval of Suitability.

(6) No person shall use, sell, or distribute or offer for use, sale or distribution sludge or septage as a commercial fertilizer or as a soil conditioner, as those terms are defined in M.G.L. c. 128, § 64, except in compliance with M.G.L. c. 128, §§ 64 through 83.

32.12: Criteria for Approval of Suitability

In order to receive an Approval of Suitability, an owner or operator shall demonstrate that the sludge or septage shall meet the following criteria:

(1) Stabilization.

(a) Minimum Requirement. All sludge and all septage shall be stabilized by a process which will significantly reduce pathogens. Acceptable processes which will significantly reduce pathogens are listed or described in Appendix A, 310 CMR 32.80.

(b) Additional Stabilization Requirements. Sludge or septage shall be further stabilized by a process listed or described in Appendix B, 310 CMR 32.81, if:

1. the sludge is or is intended to be classified as Type I;
2. the sludge or septage is or is intended to be land applied to a site where a crop for direct human consumption is or is intended to be planted within 24 months after the land application of such sludge or septage, and where such sludge or septage will be in direct contact with the edible portion of the crop; or
3. the sludge or septage is not mixed into the soil within 48 hours after land application.

(c) Variance. An owner or operator who produces Type II or Type III sludge which, before any stabilization, contains insignificant levels of pathogens, may apply for a variance from the stabilization requirements in 310 CMR 32.12(1)(a);

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(d) The Department may grant a variance from 310 CMR 32.12(1)(a) and (b) after consultation with the board of health of the city or town in which the sludge is or is intended to be land applied or, if unknown, the board of health of the city or town in which the owner's or operator's facility is located. The Department shall make note of any such variance in the Approval of Suitability. The Department shall grant no such variance for Type I sludge or for any septage.

(2) Classification.

(a) Type I Sludge.

- 1. Septage shall not be eligible for classification as Type I.
- 2. Sludge shall be classified as Type I if:
 - a. it is stabilized by a process deemed acceptable to the Department pursuant to 310 CMR 32.12(1)(b) and 32.81;
 - b. it is not putrescible; and
 - c. the concentration of substances it contains does not exceed the limits set forth in the following table:

TABLE 32.12(2)(a)

<u>Heavy Metals or Chemicals</u>	<u>Maximum Allowable Concentration in Parts Per Million Dry Weight</u>
Cadmium	14
Lead	300
Nickel	200
Zinc	2500
Copper	1000
Chromium (Total)	1000
Mercury	10
Boron (water soluble)	300
Molybdenum in Type I sludge which is to be applied to land utilized for grazing or on land upon which one or more forage crops are inten- ded to be grown.	10
Molybdenum in Type I sludge which is not to be applied to land utilized for grazing or on land upon which one or more forage crops are intended to be grown.	25
PCBs in Type I sludge which is a commercial fertilizer pursuant to 310 CMR 32.11(6)	2
PCBs in Type I sludge which is soil conditioner pursuant to 310 CMR 32.11(6)	1

- (b) Type II Sludge or Septage. Sludge or septage shall be classified as Type II if:
- 1. it is stabilized by a process deemed acceptable to the Department pursuant to 310 CMR 32.12(1)(a), (b), or (c); and
 - 2. it contains substances in concentrations which do not exceed the limits set forth in the following table:

32.12: continued

TABLE 32.12(2)(b)

Heavy Metals or Chemicals	Maximum Allowable Concentration in Parts Per Million Dry Weight
Cadmium	25
Lead	1000
Nickel	200
Zinc	2500
Copper	1000
Chromium (Total)	1000
Mercury	10
Boron (Water soluble)	300
PCBs	10
Molybdenum in Type II sludge which is to be applied to land utilized for grazing or on land upon which one or more forage crops are intended to be grown.	10
Molybdenum in Type II sludge which is not to be applied to land utilized for grazing or on land upon which one or more forage crops are intended to be grown.	25

- (c) Type III Sludge or Septage. Sludge or septage shall be classified as Type III if:
1. it is stabilized by a process deemed acceptable to the Department pursuant to 310 CMR 32.12(1)(a), (b), or (c); and
 2. the concentration of any substance it contains exceeds any limit set forth in Table 32.12(2)(b).

32.13: Obtaining and Keeping an Approval of Suitability

In order to obtain and keep a Department Approval of Suitability, the owner or operator shall comply with the following requirements:

- (1) For sludge, the owner or operator shall submit to the Department an application which shall include at least the following:
- (a) a listing of industrial discharges to the owner's or operator's facility including, whenever known, a description, by quantity and quality, of the content of all industrial discharges to such facility; and
 - (b) the quantity of septage discharged into the owner's or operator's facility, each expressed in gallons of septage per day; and
 - (c) the daily water or wastewater flow through the owner's or operator's facility, expressed in gallons per day; and
 - (d) the quantity of sludge generated by the owner's or operator's facility, expressed in dry tons of sludge per day; and
 - (e) a description of the stabilization process the owner or operator proposes to utilize to comply with 310 CMR 32.12; and
 - (f) a sampling and analysis plan which describes
 1. the proposed sampling methods and sampling frequency;
 2. the proposed sampling locations;
 3. the proposed procedure for handling samples;
 4. the name and address of the laboratory to which the samples will be sent for analysis; and
 5. the procedure the laboratory proposes to utilize to check and analyze the samples.
- (2) For septage, the owner or operator shall submit to the Department an application which shall include at least the following:

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- (a) a description, by quantity and quality, of all materials contributed to the septage by industrial and commercial establishments and institutions; and
- (b) the estimated quantity of septage received, stored, or disposed of by the owner or operator, each expressed in gallons per day; and
- (c) a description of the stabilization process the owner or operator proposes to utilize to comply with 310 CMR 32.12; and
- (d) a sampling and analysis plan which describes
 - 1. the proposed sampling methods and frequency;
 - 2. the proposed sampling locations;
 - 3. the proposed procedure for handling samples;
 - 4. the name and address of the laboratory to which the samples will be sent for analysis; and
 - 5. the procedure the laboratory proposes to utilize to check and analyze the samples.

(3) All samples taken in accordance with the sampling and analysis plan shall be representative samples of the sludge or septage to be used, sold, or distributed, or offered for use, sale, or distribution. For sludge, this shall mean that such samples shall be taken at the last point in the stabilization process before the sludge is used, sold, or distributed, or offered for use, sale, or distribution.

(4) The Department shall accept data only which has been obtained in accordance with an approved sampling and analysis plan. All sampling and analysis shall be in compliance with 310 CMR 32.13, and with 310 CMR 32.70.

(5) Sampling and analysis shall be for the following substances:

(a) in all cases for the following, each, except for pH and percent solids, expressed in terms of dry weight:

- 1. pH,
- 2. percent solids,
- 3. percent Nitrogen (N),
- 4. percent Ammonium Nitrogen (NH₄-N),
- 5. percent Nitrogen Nitrate (NO₃-N),
- 6. percent Phosphorus (P),
- 7. percent Potassium (K),
- 8. parts per million Cadmium (Cd),
- 9. parts per million Total Chromium (Cr),
- 10. parts per million Copper (Cu),
- 11. parts per million Lead (Pb),
- 12. parts per million Mercury (Hg),
- 13. parts per million Nickel (Ni),
- 14. parts per million Zinc (Zn),
- 15. parts per million Molybdenum (Mo),
- 16. parts per million Boron (B), and
- 17. parts per million PCBs.

(b) those organic chemicals for which drinking water standards or guidelines exist either in Federal or Massachusetts regulations or in any guidance document approved by the Department. 310 CMR 32.12(2) may be waived if an owner or operator persuades the Department that during the two year period for which the Approval of Suitability is to be issued, the sludge or septage is not and will not be applied or stored over an existing, planned, or potential groundwater public water supply or within 2,500 feet of a well used as a source of drinking water supply by a public water system, or within 2,500 feet of the high water mark of any Class A water.

(c) any additional substance for which sampling and analysis is required by the Department, before or after the sludge or septage is approved by the Department pursuant to 310 CMR 32.11. Such a requirement may be either at the request of the board of health of a city or town in which sludge or septage is to be land applied or on the Department's own initiative upon review of information submitted in compliance with 310 CMR 32.13(1) and (2) or of any other information which the Department has.

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(6) For at least six months before the application for an Approval of Suitability is filed pursuant to 310 CMR 32.11, while the application is pending, and for so long as such Approval of Suitability remains in effect, the owner or operator shall analyze the sludge or septage at least as often as is specified in the following table:

TABLE 32.13

I. Sludge

Flow of water or wastewater (million gallons per day)	Minimum Frequency of Sampling Period and Analysis
Less than one and no industrial discharge into the water or wastewater treatment system	One sampling period every six months
Less than one and any industrial discharge into the water or wastewater treatment system	One sampling period every three months
one - five	One sampling period every three months
More than five	One sampling period every month

II. Septage

Gallons of Septage per Day_____	Minimum Frequency of Sampling and Analysis
Less than 5,000	One sampling period every six months
5,000 - 15,000	One sampling period every three months
More than 15,000	One sampling period every month

(7) On its own initiative or at the request of the board of health of a city or town in which the owner's or operator's facility or the land application site is located, the Department may take the following action both before and after the sludge or septage is approved by the Department pursuant to 310 CMR 32.11:

- (a) increase the required sampling frequency;
- (b) require a change in the sampling method or location(s) if what was previously approved did not result in obtaining samples which were representative of the sludge or septage;
- (c) reduce the required sampling frequency and/or substances for which sampling and analysis are required if the sludge or septage quality consistently meets the limitations set forth in 310 CMR 32.12(2)(a), (b), or (c), as the case may be. Reduction shall be in accordance with the following schedule:

Required Sampling Frequency	Number of Consecutive Result Reports	Frequency Reduction to	Substance Reduction
One sampling period every six months	Two consecutive	One sampling period every 12 months	As determined by the Department
One sampling period every three months	Four consecutive	One sampling period every six months	As determined by the Department
One sampling period every month	Eight consecutive	One sampling period every three months	As determined by the Department

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(8) If the Department, pursuant to 310 CMR 32.13(5)(c) or 32.13(7), makes any change in sludge or septage monitoring requirements, the Department shall give written notice of such change to the owner or operator, to the board of health of the city or town in which the owner's or operator's facility is located, and to any board of health which makes a request for such change pursuant to 310 CMR 32.13(5)(c) or 32.13(7).

(9) Immediately after receiving the results of each analysis, the owner or operator shall send a copy of said results to the Department, to the board of health of the city or town in which the owner's or operator's facility is located, and to the board(s) of health which requested a change in sampling pursuant to 310 CMR 32.13(5)(c) or 32.13(7).

(10) Whenever the Department grants an Approval of Suitability pursuant to 310 CMR 32.11, the Department shall send a copy of such Approval of Suitability to the owner or operator, to the board of health of the city or town in which the owner's or operator's facility is located, and to the board(s) of health which requested a change in the sampling pursuant to 310 CMR 32.13(5)(c) or 32.13(7).

32.14: Additional Requirements for Approval of Suitability for Type I Sludge

(1) In order to obtain an Approval of Suitability for Type I sludge, an owner or operator, in addition to complying with 310 CMR 32.13, shall:

- (a) state in the application submitted to the Department that an Approval of Suitability is being sought for Type I sludge;
- (b) include in the application to the Department for Approval of Suitability the following information about marketing and distribution:
 - 1. a statement of whether the Type I sludge is to be used by, sold to, or distributed to, or offered for use, sale or distribution to the general public or to specific persons and whether the sludge is to be sold or given away to each such intended recipient;
 - 2. identification by name, if known, of each person who will use or to whom will be sold, distributed, or offered for use, sale, or distribution sludge in lots greater than five cubic yards;
 - 3. a description of the estimated amount of sludge to be used by, sold to, or distributed to, or offered for use, sale, or distribution to the general public and/or to persons in lots greater than five cubic yards;
- (c) send to the board of health of the city or town in which the owner's or operator's facility is located a copy of the application submitted to the Department pursuant to 310 CMR 32.13(1) and 32.14(1)(a) and (b).

(2) When the Department has determined that it has received a fully completed application for Approval of Suitability for Type I sludge, it shall so notify in writing the board of health of the city or town in which the owner's or operator's facility is located. The Department shall not approve the use, sale, or distribution or offering for use, sale, or distribution of Type I sludge without the written concurrence of the board of health of the city or town in which the owner's or operator's facility is located, provided that such concurrence is not unreasonably withheld. Said board of health shall be deemed to have given such concurrence unless it gives written notice to the contrary to the Department not later than 35 days after the date of notice given the board of health pursuant to the first sentence of 310 CMR 32.14(2).

32.20: General Requirements for Land Application

(1) No person shall land apply any Type II or Type III sludge or septage on any land within Massachusetts unless such land application is in compliance with 310 CMR 32.20 and 310 CMR 32.21 through 32.29.

(2) The land application of sludge or septage shall be in accordance with good agricultural practices as recommended by the Cooperative Extension Service or the Soil Conservation Service.

32.21: Site Requirements for Land Application of Type II or Type III Sludge or Septage

(1) Soil Texture.

(a) Except as provided in 310 CMR 32.21(1)(b), Type II or Type III sludge or septage may be land applied only on land where the surface soil meets the criteria for the following soil textural classes as designated by the USDA:

1. sandy loam.
2. sandy clay loam.
3. fine sandy loam.
4. loam.
5. loamy sand.
6. very fine sandy loam.
7. fine silt.
8. silt.
9. silt loam.
10. clay loam.
11. silty clay loam.
12. sandy clay.
13. silty clay.

(b) If the Department determines that there is minimal risk of contamination of existing, planned, or potential groundwater public water supply, the Department may grant approval for land application on land whose soil has coarse sand, as defined in 310 CMR 32.05. Such approval shall be valid only if given by the Department expressly and in writing.

(2) Soil Drainage.

(a) Land application of Type II or Type III sludge or septage shall not be permitted on any site where the soil, when moist, has within three feet of the ground surface:

1. mottles with a Munsell color notation chroma of 2 or less over 5% or more of the observed soil horizon surface, or
2. dominant colors in the matrix with a Munsell color notation chroma of one or less if any mottles present in the observed soil horizon surface do not cover more than 5% of the observed soil horizon surface, or if there are no mottles present in the observed soil horizon surface.

(b) The Department may require a greater distance between the ground surface and the maximum high groundwater table than the distance provided for pursuant to 310 CMR 32.21(2)(a) if sludge or septage is, or is intended to be, land applied over an existing, planned, or potential groundwater public water supply.

(3) Depth to Groundwater. There shall be a minimum of three feet between the lowest point of land application of Type II or Type III sludge or septage and the maximum high groundwater table. The Department may require a greater distance between the lowest point of land application and the maximum high groundwater table than the distance provided for in the preceding sentence if sludge or septage is, or is intended to be, land applied over an existing, planned, or potential groundwater public water supply.

(4) Depth to Bedrock. There shall be a minimum distance of three feet between bedrock and the lowest point of land application of Type II or Type III sludge or septage. The Department may require a greater distance between the lowest point of land application and bedrock if the location in question is over an aquifer whose groundwater supplies a bedrock well.

(5) Soil pH. No Type II or Type III sludge or septage shall be land applied at a site where the pH of the surface soil is below 6.5 at the time of land application or would go below 6.5 as a result of mixing the soil with the sludge or septage.

32.21: continued

(6) Site Control Measures. Type II or Type III sludge or septage shall at all times be confined to the site of land application. Land application of such sludge or septage shall be in accordance with soil conservation practices which minimize run-off and soil loss through erosion. The Department may require that measures such as run-off prevention or erosion control methods be instituted at a land application site in order to prevent the contamination of ground water or surface water by pollutants originating from the land applied sludge or septage. Specific measures for run-off prevention or erosion control shall be submitted to the Department for its approval prior to their implementation. Among measures that may be approved are those recommended by the Cooperative Extension Service, USDA Soil Conservation Service, or other qualified persons.

(7) Slope. Type II or Type III sludge or septage shall not, without the prior express written approval of the Department, be land applied on any land whose slope exceeds 8% from the horizontal plane.

32.22: Water Pollution Prevention Requirements for Land Application of Type II or Type III Sludge or Septage

(1) Protecting Public Water Supplies.

(a) Except as provided in 310 CMR 32.22(1)(b), no Type II or Type III sludge or septage shall be land applied anywhere within a radius of 2,500 feet of a well used as a source of drinking water supply by a public water system. Except as provided in 310 CMR 32.22(1)(b), no sludge or septage shall be land applied within 2,500 feet of the high water mark of any Class A water.

(b) Land application of Type II or Type III sludge or septage within a radius of 2,500 feet of a well used as a source of drinking water supply by a public water system, or within 2,500 feet of the high water mark of any Class A water, may be approved only if the following requirements are met:

1. a person wishing to land apply such sludge or septage in such a location applies in writing to the Department for approval to do so; and
2. the applicant persuades the Department that the sludge or septage contains no significant concentration of organic chemicals; and
3. the applicant persuades the Department, based upon a hydrogeologic study, that there is and will be no significant risk of pollution of any water mentioned in 310 CMR 32.22(1)(a); and
4. the Department expressly and in writing approves such land application, subject to a determination by the Department that the applicant has made the showings required by 310 CMR 32.22(1)(b)2 and 3; and
5. no land application of such sludge or septage shall be allowed anywhere within a radius of 400 feet of a well used as a source of drinking water supply by a public water system; and
6. such land application is otherwise in compliance with 310 CMR 32.00 and with the terms and conditions of the approval granted by the Department.

(2) Protecting Private Drinking Water Supply Wells. No Type II or Type III sludge or septage shall be land applied anywhere within a radius of 300 feet of a private drinking water supply well.

(3) Protecting Other Surface Waters. The Department may on a case-by-case basis establish a distance between the location of the land application site and surface water to which 310 CMR 32.22(1) does not apply for the purpose of preventing adverse impacts on the use or quality of that surface water.

(4) Protecting Drainage Channels. No Type II or Type III sludge or septage shall be land applied within the high water mark of field depressions or ditches through which water flows during snow melts or heavy rainfall.

32.22: continued

(5) Groundwater Monitoring. The Department may, on a case-by-case basis, require groundwater monitoring when the Department deems such action necessary or appropriate to assure or verify compliance with 310 CMR 32.00.

32.23: Application Management Requirements for Type II or Type III Sludge or Septage

(1) Application Rate.

(a) Type II or Type III sludge or septage shall be land applied at a rate which shall not exceed the nitrogen requirements of the crop grown or intended to be grown at the site of such land application.

(b) Type II or Type III sludge or septage shall be land applied at a rate which does not exceed the maximum annual allowable concentration specified in the following table:

TABLE 32.23(1)(b)

<u>Substance</u>	<u>Maximum Annual Allowable Application</u> <u>Pounds/Acre</u>
Cadmium	0.45

(c) Type II or Type III sludge or septage shall be land applied at a rate which does not allow the maximum cumulative application, excluding the soil background level, to exceed the maximum cumulative allowable levels specified in the following table:

TABLE 32.23(1)(c)

<u>Substance</u>	<u>Maximum Cumulative Application</u>	
	<u>Pounds/Acre</u>	
	<u>Cation Exchange Capacity in meq/100g</u>	
	<u>Less than 5</u>	<u>5 or More</u>
Cadmium	4.5	4.5
Zinc	250.0	500.0
Copper	125.0	250.0
Nickel	50.0	100.0

(d) Type II or Type III sludge or septage shall be land applied at a rate which does not allow the cumulative level, including the background level, to exceed the maximum cumulative allowable concentration specified in the following table:

TABLE 32.23(1)(d)

	Maximum Annual Allowable Soil Concentration Including Background Level Pounds/Acre	
Substance	Cation Exchange Capacity in meq/100g	
	Less than 5	5 or More
Lead	445.0	600.0
PCBs	2.0	2.0

(e) No Type II or Type III sludge or septage shall be land applied on pasture land if the concentration of PCBs in the sludge or septage exceeds two parts per million.

(f) Land application of Type II or Type III sludge or septage at a rate which allows cumulative level of lead to exceed the amount specified in Table 32.23(1)(d) may be allowed only if all the following requirements are met:

32.23: continued

1. a person wishing to land apply such sludge or septage at such a rate applies in writing to the Department for approval to do so, and
2. the applicant persuades the Department that allowing additional lead in the soil will not create a significant risk to public health or the environment, and
3. the applicant persuades the Department that, when the cation exchange capacity of the soil is five or more milliequivalents per 100 grams, the maximum cumulative application of lead to the soil shall not exceed 715 pounds per acre, and
4. the Department expressly and in writing approves such land application, after a determination by the Department that the applicant has made the showings required by 310 CMR 32.23(1)(f)2. and 3., and
5. such land application is otherwise in compliance with 310 CMR 32.00 and with the terms and conditions of the approval granted by the Department.

(2) Incorporation into Soil. No person who land applies Type II or Type III sludge or septage shall allow more than 48 hours to elapse between the time such sludge or septage is first land applied to the surface of the soil and the time the sludge or septage is mixed into the soil or beneath the surface of the soil. The requirement in the preceding sentence shall not apply to the land application of sludge or septage which has been stabilized by a process deemed acceptable to the Department pursuant to 310 CMR 32.12(1)(b) and which is not putrescible.

(3) Public Access. A person who land applies Type II or Type III sludge or septage shall control public access to the site of such land application during and for the 12 months after such application unless the sludge or septage was stabilized by a process deemed acceptable to the Department pursuant to 310 CMR 32.12(1)(b). If the site is likely to be frequented by the general public, or if inadvertent public contact with the sludge or septage is likely, such control of public access shall be by fencing or posting of appropriate signs.

(4) Grazing Animals. For at least 30 days after Type II or Type III sludge or septage is land applied at a site, animals shall not be permitted to graze on that site.

(5) Crops

(a) No Type II or Type III sludge or septage shall be land applied at a site if, at the time of land application, there are growing on the site crops which may be consumed by humans or grazing animals.

(b) Type II or Type III sludge or septage may be land applied to the surface of land on which hay is grown or is intended to be grown, or to the surface of pasture land, only if 310 CMR 32.23(2) is complied with and such land application occurs prior to the growth or regrowth of a crop on that land.

(c) Only Type I sludge, or Type II or Type III sludge or septage which has been stabilized by a process deemed acceptable to the Department pursuant to 310 CMR 32.12(1)(b), may be land applied at a site if:

1. crops for direct human consumption are, or are intended to be, planted on that site within 24 months of land application, and
2. there will be direct contact between the edible portion of such crops and the sludge or septage.

(6) Seasonal Restrictions. No person shall land apply Type II or Type III sludge or septage:

- (a) during periods of rain, or
- (b) when the soil is frozen, or
- (c) when the soil is covered with snow or ice, or
- (d) when the soil is saturated with water.

32.24: Soil Sampling Requirements for Land Application of Type II or Type III Sludge or Septage

(1) Frequency. A representative soil sample shall be taken and analyzed from a site prior to:

32.24: continued

- (a) the first application of Type II or Type III sludge or septage to that site, and
- (b) the filing of an application to the Department for a fifth Land Application Certificate after four Land Application Certificates have been issued without representative soil samples having been analyzed.

All soil samples shall be taken and analyzed in compliance with 310 CMR 32.24, in order to be deemed in compliance with this requirement.

(2) **Parameters.** Soil samples shall be sampled and analyzed for the following, each, except for pH and cation exchange capacity, expressed in terms of total (and not extractable) pounds per acre:

- (a) pH,
- (b) cation exchange capacity (CEC), expressed in milliequivalents per 100 grams of soil,
- (c) Total Nitrogen (N),
- (d) Ammonium Nitrogen (NH₄-N),
- (e) Nitrate Nitrogen (NO₃-N),
- (f) Phosphorus (P),
- (g) Potassium (K),
- (h) Cadmium (Cd),
- (i) Total Chromium (Cr),
- (j) Copper (Cu),
- (k) Lead (Pb),
- (l) Mercury (Hg),
- (m) Nickel (Ni),
- (n) Zinc (Zn),
- (o) PCBs, if sludge or septage contains concentrations of PCBs equal to or greater than two parts per million, and
- (p) any additional substance for which sampling and analysis is required by the Department at the request of the board of health of a city or town in which Type II or Type III sludge or septage is or is intended to be land applied or on the Department's own initiative upon review of information submitted in compliance with 310 CMR 32.00 or of any other information which the Department has.

(3) **Alternative Monitoring Requirements.** On its own initiative or at the request of the board of health of a city or town in which Type II or Type III sludge or septage is being land applied, the Department may either increase sampling frequency if analysis results are inadequate or inconsistent, or reduce sampling frequency and/or the materials for which sampling and analysis are required if the soil quality consistently meets the requirements set forth in 310 CMR 32.23. The Department shall give written notice of approved changes in monitoring, including the duration of such permitted changes, to the applicant and the Board of Health of the city or town in which the sludge or septage is to be land applied.

(4) **Methods.** All sampling and analysis shall be in compliance with 310 CMR 32.70.

32.25: Approval of Site for Land Application of Type II or Type III Sludge or Septage

(1) No person shall land apply Type II or Type III sludge or septage on any site without the prior written approval of the Department, issued in the form of a Land Application Certificate. Each Land Application Certificate shall be valid only for the site specified therein. Each Land Application Certificate shall be valid for no more than one year.

(2) Each person who intends to or does land apply Type II or Type III sludge or septage on any site shall submit to the Department for its approval an application for a Land Application Certificate. At the time it submits the application to the Department, the applicant shall submit a copy of the application to the board of health of the city or town in which the land application site is located. If the person who intends to or does land apply Type II or Type III sludge or septage on a site is different from the person who owns the site, both persons shall be considered applicants and both shall sign, and be responsible for the contents of, the application. The Department may prescribe an application form which shall be used by each person applying for a Land Application Certificate.

32.24: continued

(3) Each application for a Land Application Certificate shall contain all information necessary to persuade the Department that sludge or septage will be land applied at the site in question only in compliance with 310 CMR 32.00. Without limiting the generality of the previous sentence, each application for a Land Application Certificate shall include at a minimum the following information, noting the source of the information where applicable:

- (a) A scaled topographic map, preferably of the United States Geological Survey, showing:
 - 1. the location of the land application site,
 - 2. the location of the sludge or septage storage site, and
 - 3. all sources of water supply which are used by public or non-public water systems and which are on or abutting the site.
- (b) A scaled plot plan showing:
 - 1. the site where sludge or septage is to be land applied;
 - 2. the site where sludge or septage is to be stored;
 - 3. the location of every well which is known by the applicant and which is:
 - a. used as a source of drinking water supply by a public water system or as a private drinking water supply well, and
 - b. is located within 2,500 feet of the land application site or of the site where sludge or septage is to be stored;
 - 4. the location of every surface water which is used as a source of drinking water supply by a public water system and which is located within 2,500 feet of either the land application site or the site where sludge or septage is to be stored;
 - 5. the location of all surface water within 2,500 feet of the land application site or of the site where sludge or septage is to be stored; and
 - 6. the location of the 100-year flood plain, if applicable, as mapped by the Federal Emergency Management Agency.
- (c) The number of acres available for, or intended to be used for, land application.
- (d) Information about the soil at the site, including:
 - 1. the slope of the site, as measured from the horizontal plane;
 - 2. a Soil Conservation Service soil survey map or a comparable soil map, prepared by a scientist who has expertise in soil and experience in mapping, which delineates the area(s) in which sludge or septage is to be land applied or stored or both;
 - 3. a USDA description of the soil, including such information as the soil name, soil texture, physical and chemical properties, and other information appropriate to determine whether the soil is suitable for land application of Type II or Type III sludge or septage.
- (e) The depth to maximum high groundwater table.
- (f) Erosion control and run-off prevention practices which are needed and/or used or intended to be used.
- (g) Drainage practices which are needed and/or used or intended to be used.
- (h) The results of soil analysis done in compliance with 310 CMR 32.24.
- (i) Any other information as required by the Department concerning the site.
- (j) Information about what is to be grown on the land application site, including:
 - 1. the type of crop or vegetation being grown or to be grown,
 - 2. the anticipated planting time,
 - 3. the anticipated harvest time, and
 - 4. the anticipated use of the crop or vegetation.
- (k) Information about what animals are to be grazed on the land application site, including:
 - 1. what kinds of animals are being grazed or to be grazed, and the number of each type of animal,
 - 2. the length of the grazing periods,
 - 3. the amount of time between the completion of land application and the beginning of grazing on the land application site, and
 - 4. The supplemental feeding practices being used or to be used.

32.25: continued

- (l) The name and address of every facility from which sludge or septage is or will be obtained.
- (m) Information about how land application is to be done, including:
 - 1. the proposed land application rate,
 - 2. the proposed land application method, and
 - 3. the proposed date(s) of land application.
- (n) Information about how the sludge or septage is to be transported to the land application site, including:
 - 1. the proposed method of transportation,
 - 2. the proposed route of transportation,
 - 3. the proposed frequency and date(s) of transportation, and
 - 4. the name and address of the transporter.
- (o) Information about the sludge or septage to be land applied, including:
 - 1. the type of sludge or septage to be land applied and, for each type, the amount to be land applied, and
 - 2. the amount and type of each sludge and septage previously land applied at the site, to the extent known, and
 - 3. whether or not the applicant proposes to use any Type II or Type III sludge or septage for which the Department has granted a variance from a stabilization requirement pursuant to 310 CMR 32.12(1)(c).
- (p) A general statement describing the measures to be taken to otherwise comply with 310 CMR 32.00.

(4) Each Land Application Certificate shall be subject to such terms and conditions as the Department may reasonably impose. Each person receiving a Land Application Certificate shall comply with such terms and conditions.

(5) When the Department has determined that it has received a fully completed application for a Land Application Certificate, it shall so notify the applicant and the board of health of the city or town in which the land application site is located. The Department shall seek the concurrence of the board of health of the city or town in which the land application site is located prior to granting a Land Application Certificate. Said board of health shall be deemed to have given concurrence without terms or conditions unless it notifies the Department to the contrary not later than 35 days after the notice given by the Department to the board of health pursuant to the first sentence of 310 CMR 32.25(5). The Department shall grant a Land Application Certificate without the concurrence of said board of health only if the Department determines, after evaluating relevant evidence, that the board of health has acted unreasonably in refusing or conditioning its concurrence.

32.26: Recording Notice of Land Application of Type III Sludge or Septage

- (1) Every person who land applies any Type III sludge or septage, or who owns land on which any Type III sludge or septage is land applied, shall record in the registry of deeds, or if the land in question is registered land, in the registry section of the land court for the district wherein the land lies, a notice which shall contain, at a minimum, the following:
 - (a) the book and page number or other appropriate cross-reference for the land in the registry of deeds or land court registry section,
 - (b) the date on which the Department issued the Land Application Certificate pursuant to which the Type III sludge or septage was land applied, and the expiration date of said Land Application Certificate,
 - (c) the name and address of each facility from which the Type III sludge or septage land applied on the land was obtained, and
 - (d) for each such facility, the content of the Type III sludge or septage, as stated on the results of the most recent analysis thereof, and the dates on which each such analysis was taken and analyzed.

32.26: continued

(2) The deadline for compliance with 310 CMR 32.26(1) shall be when the earliest of the following events occurs:

- (a) before the conveyance or lease of the land in question, or any part thereof,
- (b) 30 days after the expiration of the Land Application Certificate, or
- (c) immediately after the Type III sludge or septage was land applied if it was land applied without a Land Application Certificate in violation of 310 CMR 32.00.

32.30: Requirements for Any Storage of Sludge or Septage

No person shall store sludge or septage except in compliance with the following requirements:

(1) Protecting All Groundwater. Sludge or septage shall not be stored at any location where there is less than four feet of unsaturated soil between the lowest point of such storage and the maximum high groundwater table.

(2) Protecting Groundwater Sources of Public Water Supply. Sludge or septage shall not be stored anywhere within a radius of 2,500 feet of any location under which there is an existing, planned, or potential groundwater public water supply unless either

- (a) a hydrogeologic study persuades the Department that such storage will not result in contamination of such groundwater, or
- (b) the sludge or septage is stored in watertight containers or by another comparable method which prevents leakage.

(3) Protecting Private Water Supply Wells. Sludge or septage shall not be stored anywhere within a radius of 500 feet of any well used as a private drinking water supply well unless such sludge or septage is stored in watertight containers or by another comparable method which prevents leakage.

(4) Protecting Surface Waters.

- (a) Unless it is stored in a watertight container or by another comparable method which prevents leakage, sludge or septage shall not be stored
 - 1. within the watershed of any Class A surface water,
 - 2. within any 100-year flood plain, as then most recently mapped by the Federal Emergency Management Agency,
 - 3. between the high water line of any pond or lake and a line 500 feet landward of the high water line of that pond or lake.
- (b) Sludge or septage shall not be stored below the high water mark of any surface water.

(5) Control Measures. Sludge or septage shall be stored in a manner that does not create or threaten to create:

- 1. a nuisance, or
- 2. a threat to public health, or
- 3. a threat to the environment.

32.31: Additional Requirements for Long-Term Storage of Sludge or Septage

No person shall store sludge or septage for more than 42 days within any six month period except in compliance with 310 CMR 32.30 and the following additional requirements:

(1) Such storage of sludge or septage shall not occur at a site without the prior express written approval of the board of health of the city or town in which that site is located. The previous sentence shall not apply to such storage of sludge at the site of a wastewater treatment facility which generated all of such sludge if such facility has a permit from the Department pursuant to M.G.L. c. 21, § 43.

32.31: continued

(2) Storage of sludge or septage shall not occur without the Department's prior written approval of the plans for such storage. All such plans shall provide measures for controlling odors. If a storage facility receives or is intended to receive an average of 2,000 gallons or more of septage per day, the plans for such storage facility shall be prepared by a Massachusetts registered professional engineer.

32.40: Requirements for Transportation of Sludge or Septage

(1) No person shall transport sludge or septage for land application purposes in a manner which creates, or threatens to create, a nuisance or a hazard to public health or the environment.

(2) Every person who transports sludge or septage for land application purposes shall transport sludge or septage only:

- (a) in a tank, or
- (b) in a watertight container, or
- (c) by some other means acceptable to the Department.

(3) Every person who transports septage shall do so in compliance with 310 CMR 15.00: *Minimum Requirements for the Subsurface Disposal of Sanitary Sewage State Environmental Code, Title 5.*

32.50: Requirements for the Sale or Distribution of Sludge and Septage

32.51: Requirements for the Sale or Distribution of Type I Sludge

(1) No person shall sell or distribute, or offer for use, sale, or distribution any Type I sludge unless, pursuant to 310 CMR 32.00, the Department has approved such sludge as Type I sludge and that approval is valid at the time the Type I sludge is sold or distributed, or offered for use, sale, or distribution.

(2) No person shall use or obtain Type I sludge unless such sludge has a valid Approval of Suitability.

(3) Labelling of Type I sludge. Each container in which Type I sludge is sold, distributed, or transported or offered for use, sale, or distribution shall itself prominently display or, if such display is not practicable, shall be accompanied by a shipping paper which shall prominently display the following:

- (a) identification of the material as Type I sludge,
- (b) the date of issuance of the Department Approval of Suitability for the Type I sludge and the expiration date thereof,
- (c) instructions for land applying the material in accordance with proper agricultural practice, including but not limited to, identification of proper agronomic application rates which shall not cause exceedance of the nitrogen requirements of the crop to be grown or intended to be grown, and
- (d) type I sludge containing greater than ten parts per million of molybdenum shall be accompanied by a written warning that the sludge should not be used on pasture lands subject to grazing or on lands where crops are grown or intended to be grown for forage. Use of the sludge under these circumstances may result in forage crops containing levels of molybdenum which are toxic to ruminants.
- (e) all other instructions and information required by law.

32.52: Requirements for the Sale or Distribution of Type II or Type III Sludge or Septage

(1) No person shall sell or distribute, or offer for use, sale, or distribution any Type II or Type III sludge or septage unless:

32.52: continued

- (a) the Department has issued an Approval of Suitability for such sludge or septage and that Approval of Suitability for such sludge or septage is valid at the time such sludge or septage is sold or distributed or offered for sale, distribution, or use;
 - (b) the Department has granted a Land Application Certificate authorizing the person purchasing or obtaining the sludge or septage to use that specific type sludge or septage which is being sold or distributed or offered for use, sale, or distribution.
- (2) Each person who sells or distributes or offers for sale or distribution Type II or Type III sludge or septage shall be responsible for ascertaining before selling or distributing such sludge or septage that the person obtaining or purchasing such sludge or septage has been granted a Land Application Certificate by the Department which:
- (a) permits the use of that type sludge or septage being sold or distributed, and
 - (b) authorizes the amount of that type sludge or septage being obtained.
- (3) Each person who sells or distributes or offers for sale or distribution Type II or Type III sludge or septage shall provide the person purchasing or obtaining such sludge or septage with the following information:
- (a) the name and address appearing on the Approval of Suitability;
 - (b) the dates of issuance and expiration of the Approval of Suitability for the sludge or septage being sold or distributed;
 - (c) the results of the most recent analysis of the sludge or septage being sold or distributed and the dates on which said analysis was taken and analyzed;
 - (d) the amount of sludge or septage being sold or distributed.
- (4) Each person who uses Type II or Type III sludge or septage shall be responsible for ascertaining, before purchasing or obtaining such sludge or septage, that such sludge or septage is the subject of a Approval of Suitability then in effect.
- (5) Each container in which Type II or Type III sludge or septage is sold, distributed, or transported, or offered for use, sale, or distribution shall itself prominently display or, if such display is not practicable, shall be accompanied by a shipping paper which shall prominently display the following:
- (a) the type classification of the sludge or septage (i.e. Type II or Type III),
 - (b) the date of issuance of the Department Approval of Suitability for such sludge or septage and the expiration date thereof,
 - (c) notice that the material may only be used in compliance with Massachusetts land application regulations and only with prior express written approval of the Department.

Such a label shall read substantially as follows:

NOTICE: Contains Type (II or III) (sludge or septage). May be used only in compliance with Massachusetts land application regulations and only with the prior express written approval of the Department of Environmental Protection.

- (6) Type II or Type III sludge or septage containing greater than ten parts per million of molybdenum shall be accompanied by a written warning that use of such sludge or septage may result in forage crops containing levels of molybdenum which are toxic to ruminants. Sludge or septage subject to this requirement may be approved by the Department only on the condition that this requirement is complied with.
- (7) Type III sludge or septage containing greater than 300 parts per million of water soluble boron shall be accompanied by a written list of the crops for which use of such sludge or septage is recommended. Such list shall bear the words "Warning" or "Caution" and a warning that misuse of such sludge or septage can result in crop injury. Sludge or septage subject to these requirements may be approved by the Department only on the condition that these requirements are complied with.

32.60: Record Generating, Record Keeping, and Reporting Requirements

(1) General. All records required to be kept pursuant to 310 CMR 32.00 shall be kept for at least three years. All records required to be kept pursuant to 310 CMR 32.60(4)(a)4. and 32.60(5)(a)1. through 5. shall be kept permanently. All records shall be readily available for inspection by personnel of the Department or of the board of health of the city or town in which the facility or the land application site is located, as the case may be.

(2) Owner or Operator.

(a) Each owner or operator shall enter into its records the information required pursuant to 310 CMR 32.60(2)(b) and if a seller or distributor, shall enter into its records the information required pursuant to 310 CMR 32.60(3).

(b) Each owner or operator shall keep the following records:

1. the approval given by the Department pursuant to 310 CMR 32.11;
2. a description of the stabilization method used to comply with 310 CMR 32.12(1), including the address where that stabilization occurred and a detailed description of the conditions under which that stabilization actually occurred;
3. the results of analyses of all samples of the sludge or septage, including when and by whom they were taken and analyzed;
4. copies of all information and material submitted to the Department in compliance with 310 CMR 32.13 and 32.14;
5. all studies and technical data on which such information and material were based; and
6. the address of each place where sludge or septage was stored and for each such place, how long sludge or septage was stored there.

(c) Each owner or operator shall submit to the Department an annual report which shall include the information of which the owner or operator is required to keep records pursuant to 310 CMR 32.60(2)(a) and (b). For each owner or operator, such annual report shall be due on February 1 of the calendar year following the date the Department issued the Approval of Suitability pursuant to 310 CMR 32.11.

(3) Seller or Distributor of Type I Sludge.

(a) Before transferring ownership, custody, or possession of Type I sludge, the person selling or distributing such sludge shall enter into its records the following information:

1. the amount of Type I sludge distributed or sold in lots equal to or less than five cubic yards;
2. the name and addresses of each person to whom Type I sludge in lots greater than five cubic yards was sold or distributed, specifying for each such person the amount sold or distributed.

(b) Each person selling or distributing Type I sludge shall submit to the Department an annual report which shall include the information required pursuant to 310 CMR 32.60(3)(a).

(4) Seller or Distributor of Type II or Type III Sludge or Septage

(a) Before transferring ownership, custody, or possession of Type II or Type III sludge or septage, the person selling or distributing such sludge or septage shall enter into its records the following information, maintaining a separate file for each land application site:

1. the name and address, as appearing on the Land Application Certificate, of the person to whom the sludge or septage is being sold or distributed;
2. the location, as appearing on the Land Application Certificate, where the sludge or septage is being land applied;
3. the dates, as appearing on the Land Application Certificate, on which the Land Application Certificate was granted, and the Land Application Certificate expires;
4. the method and rate of land application, as appearing on the Land Application Certificate;
5. the crop to be grown, or animals to be grazed, or both, on the land in question, as appearing on the Land Application Certificate;

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6. the name of the transporter who transported the sludge from the premises of the seller or distributor, and the type of vehicle used;
 7. the name of the individual who actually took custody or possession of the sludge or septage, and the date on which he/she did so;
 8. the amount of sludge or septage authorized by the Land Application Certificate and the amount obtained for that site; and
 9. the content of the sludge or septage, based on the most recent analysis done in compliance with 310 CMR 32.13 and the dates on which the analysis was taken and analyzed.
- (b) Each person who sells or distributes Type II or Type III sludge or septage shall submit to the Department a report which shall include the information for which he or she is required to keep records pursuant to 310 CMR 32.60(4)(a).
- (5) Users of Type II or Type III Sludge or Septage.
- (a) Each person who uses Type II or Type III sludge or septage shall enter into its records the following information, keeping a separate file for each Land Application Certificate:
1. the Land Application Certificate issued by the Department pursuant to 310 CMR 32.25;
 2. the results of all soil samples taken pursuant to 310 CMR 32.24, including when and by whom they were taken and analyzed;
 3. the location of each land application site;
 4. the amount of sludge or septage spread per acre annually per site and the total cumulative addition of sludge or septage per site;
 5. date and method of application for each site;
 6. the crop grown on the land application site, and the use of the crop;
 7. what kinds of animals were grazed on the land application site;
 8. the address of each location where sludge or septage was stored and, for each such location, how long the sludge or septage was stored there;
 9. the information listed in 310 CMR 32.52(3)(a), (b), and (d).
- (b) Each person who uses sludge or septage shall submit to the Department an annual report which shall include all the information of which that person is required to keep records pursuant 310 CMR 32.60(5)(a). For each such person, such annual report shall be due on February 1 of the calendar year following the date on which the Department issued the Land Application Certificate to that person pursuant to 310 CMR 32.25.

32.70: Sampling and Analysis Requirements

- (1) General. Each sample of sludge, septage, or soil shall be sampled, handled and analyzed in accordance with best technical judgment, with guidance most recently published by the Department and the EPA, and with 310 CMR 32.70.
- (2) Sampling. Each sample shall be sampled in compliance with all of the following requirements:
- (a) The sample shall be collected in a proper manner to ensure that it is representative of the material being sampled.
 - (b) The sample shall be properly preserved immediately upon collection.
 - (c) The sample shall be properly handled and packaged in a manner that will maintain the integrity of the sample and minimize the potential for contamination.
 - (d) The sample shall be labelled to show when, from what, from where, and by whom it was taken.
 - (e) As soon as possible after it is collected, and in any event no later than its maximum holding time for reliable analysis, the sample shall be delivered to the laboratory for analysis.

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(3) Laboratories.

- (a) Each sample analyzed for the purpose of complying with 310 CMR 32.00 shall be analyzed only by a laboratory deemed acceptable by the Department for that purpose.
- (b) Each laboratory wishing to be deemed acceptable, or to continue being deemed acceptable, to the Department pursuant to 310 CMR 32.70(3)(a) shall provide to the Department a description of the quality control procedures which the laboratory uses to verify the validity of analysis results.
- (c) No laboratory shall analyze any sample by using an analysis method not previously accepted by the Department, or by deviating from an analysis method previously accepted by the Department unless the deviation has previously been accepted by the Department.

(4) Analysis. The following analysis methods may be used:

(a) Generally.

- 1. Manual of Methods for Chemical Analysis of Water and Wastes, EPA, 1983 (or the most recent edition at the time the sample is analyzed).
- 2. Standard Methods for Examination of Water and Wastewater, American Public Health Assoc. (Whatever edition is most recent at the time the sample is analyzed.)
- 3. Test Methods for Evaluation Solid Waste, Physical/Chemical Methods, EPA S.W.-846, 1980 (or most recent edition at time the sample is analyzed).
- 4. "Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples", Soil Survey Report, No. 1, Soil Conservation Service USDA, 1972.
- 5. Handbook for Sampling and Sampling Preservation of Water and Wastewater EPA-600/4-82-029, September, 1982 (or the most recent edition at the time the sample is analyzed).
- 6. Interim Methods for the Analysis of Elemental Priority Pollutants in Sludge, EPA/EMSL, 1978 (or most recent edition at the time the sample is analyzed).

(b) For cation exchange capacity and pH, *Methods of Soil Analysis*, Part 2, 2nd Edition, "Agronomy Monograph No. 9", A. L. Page *et al*, American Society of Agronomy, Madison, Wisconsin, 1982. Specifically,

- 1.1. If the pH of the soil is below 7.0, the cation exchange capacity shall be determined by using the summation of exchangeable basis and exchangeable acidity methods, paragraphs nos. 58-2 and 59-3, respectively, of said monograph.
- 2.2. If the soil is neutral, calcareous, or saline, the cation exchange capacity shall be determined by the sodium acetate method, paragraph no. 57-3 of said monograph.

(c) For cadmium, *Sampling and Analysis of Soils, Plants, Wastewater, and Sludge. Suggested Standardization and Methodology*. North Central Region Publication 230, Research Publication 170.

(d) For PCBs,

- 1. In waste material, milk, and animal feed, the method recommended from time to time by the Association of Official Analytical Chemists.
- 2. In milk and animal feed, any method recommended from time to time by the U.S. Food and Drug Administration.

(5) Reporting Analysis Results. The results of each analysis submitted to the Department pursuant to 310 CMR 32.00 shall include, to the extent applicable, the reference citation of the method used for the analysis, including all deviations from such method.

32.80: Appendix A: Acceptable Processes for Pathogen Reduction

Acceptable processes which will significantly reduce pathogens are:

- (1) Aerobic Digestion: A process during which sludge or septage is broken down by bacteria by agitating the sludge or septage, mixing it with air or oxygen, and maintaining residence times ranging from 60 days at 15°C to 40 days at 20°C, with a volatile solids reduction of at least 38%.

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- (2) Air Drying: A process in which sludge or septage is allowed to drain and/or dry on under-drained sand beds, or paved or unpaved basins in either of which the sludge or septage is at a maximum depth of nine inches. This process is acceptable only if it occurs for at least three months during which temperatures must average, on a daily basis, above 0°C for two months.
- (3) Anaerobic Digestion: A process during which sludge or septage is broken down by bacteria in the absence of oxygen at residence times ranging from 60 days at 20°C to 15 days at 35°C through 55°C, with a volatile solids reduction of at least 38%.
- (4) Low Temperature Composting: A composting process using the within-vessel, static aerated pile, or windrow methods. For all three methods, the composting temperature shall be not less than 40°C for five consecutive days, and not less than 55°C during four hours of this five day period.
- (5) Lime Stabilization: A process in which lime is added to sludge or septage to produce a pH of 12 after two hours of contact with the sludge or septage.
- (6) Other methods: Other methods or operating conditions may be deemed acceptable by the Department if the owner or operator can provide data showing that the pathogen and vector attraction of the volatile solids are reduced to an extent equivalent to the reductions achieved by any of the other methods listed above in 310 CMR 32.80. Written approval of equivalency by the Department shall be required.

32.81: Appendix B: Acceptable Processes for Additional Pathogen Reduction

Additional processes which will further reduce pathogens are listed below. The processes listed in 310 CMR 32.81(5), (6), and (7) are in addition to processes listed or described in 310 CMR 32.80.

- (1) High Temperature Composting: A composting process using either the windrow, within-vessel, or static-aerated pile method; provided that whenever the windrow method is used, a composting temperature of not less than 55°C shall be continuously maintained for at least 15 days during the composting period, and that the windrow shall be turned at least five times during this 15-day period; and provided that whenever the static-aerated pile method or the within-vessel method is used, a composting temperature of not less than 55°C shall be continuously maintained for at least three consecutive days.
- (2) Heat Drying: A process in which a dewatered sludge cake is dried by direct or indirect contact with hot gases, and the moisture content is reduced to 10% or lower. Sludge particles shall reach temperatures well in excess of 80°C, or the wet bulb temperature of the gas stream in contact with the sludge at the point where it leaves the dryer shall be in excess of 80°C.
- (3) Heat Treatment: A process in which liquid sludge or septage is maintained at temperature of at least 180°C for at least 30 consecutive minutes.
- (4) Thermophilic Aerobic Digestion: The process by which liquid sludge or septage is agitated with air or oxygen to maintain aerobic conditions at a residence time of ten days at 55°C through 60°C, and has a volatile solids reduction of at least 38%.
- (5) Electron Radiation: A process in which sludge or septage is irradiated with electrons from an accelerator at dosages of at least 1.0 megarad at room temperature, *i.e.*, approximately 20°C.
- (6) Gamma Ray Irradiation: A process in which sludge or septage is irradiated with gamma rays from certain isotopes, such as Cobalt-60 or Cesium-137, at dosages of a least 1.0 megarad at room temperature, *i.e.*, approximately 20°C.

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(7) Pasteurization: A process in which sludge or septage is maintained for at least 30 continuous minutes at a temperature of not less than 70°C.

(8) Other Methods: Other methods or operating conditions may be deemed acceptable by the Department if the owner or operator can provide data showing that the pathogen and vector attraction of the volatile solids are reduced to an extent equivalent to the reductions achieved by any of the other methods listed in 310 CMR 32.81. Written approval of equivalency by the Department shall be required.

REGULATORY AUTHORITY

310 CMR 32.00: M.G.L. c. 21, §§ 27(9), 27(12) and 43; c. 21A, § 2(28); c. 111, § 160.